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ABSTRACT

A gestalt approach to theatrical design seems to provide some ready and stable explanations for a number of issues in the scenic arts. Gestalt serves as the theoretical base for a number of experiments in psychology whose findings appear to delineate the principles of art to be used in scene design. The fundamental notion of gestalt theory identifies a major task for the role of the scene designer. Seeking to arouse and periodically relieve tension in the audience through the organization of the design elements of the stage picture (size, color, direction, form, and position), the designer is essentially inviting the audience to participate in the production, becoming an accomplice with the artist. In order to comprehend the setting, to reproduce the gestalts intended by the designer, the audience must, by the nature of the process, involve itself actively in the play. The more complex the gestalts, the greater the tension; and the more satisfying the release of tension, the more involved the audience member has become. The precision with which the design is executed, aesthetically as well as technically, is really the precision with which the designer communicates with the audience. The more effective this communication is, the greater is the theatrical experience that its audience achieves. (RL)

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FINDINGS IN EXPERIMENTAL PSYCHOLOGY AS FUNCTIONING PRINCIPLES OF THEATRICAL DESIGN

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Art is certainly personal, varying in preference and understanding from individual to individual, even within a group the size of a theatre audience. Scene design is no exception. But art is communicative--an expressive communication which intends to elicit an experience in the viewer. And communication can be most effective when it speaks with a common language. The language in the visual arts has been identified by a number of principles of design that have proven to be universal, or at least cross-cultural. Most principles, no matter how tangible, have been intuitive in nature. Over the last seventy years, however, significant research has been carried out in the fields of psychology and experimental aesthetics that has direct bearing on the guidelines that we employ in design. Many of these theories and hypotheses, principles in our case, have strong implications on the ways in which we manipulate the stage picture in the theatre arts.

The overall theoretical approach founded in psychology which seems most appropriate, or at least applicable, to theatrical design is gestalt (gestalten). Gestalt theory asserts that the whole is more than the sum of the parts(Allport, 1955, 112-47). Knowledge is structurally developed through the process of various problem-solving and closure techniques, such as intrinsic associations between current and previous stimuli. Koffka's experiments with figure-ground relationships of simple designs (1966, 13-28) and Kohler's investigations of groupings of elementary figures (1970, 46-69) have become classic studies in the fields of psychology and education.

Rudolf Arnheim further describes the function of gestalt as, ". . . any stimulus pattern which tends to be seen in such a way that the resulting structure is as simple as the given conditions permit" (1969, 44). He goes on to note a significant facet of the theory; i.e., the gestalt process is

contingent upon the introduction and release of tension. Arnheim states that, ". . . simplicity may be defined by the degree of tension that a phenomenon creates in the experience of the observer and in the correlated processes occurring in his brain" (1969, 44). The relationship of the arousal and reduction of tension to theatrical design will come into discussion later, but Arnheim's notion of simplicity should be momentarily clarified. According to Arnheim, simple is not necessarily less complex; in the artistic sense they are not antonyms. "When a work of art is praised for having simplicity; it is understood to organize a wealth of meaning and form in an overall structure that clearly defines the place and function of every detail in the whole" (1969, 45). A graphically complex visual display, for instance, may be organized in a fashion that the perceiver quickly comprehends all the elements and features, satisfying the criterion for simplicity.

Gestalt can be viewed in a much more philosophical light, however, which lends some direct understanding of the efforts of both the scenic artist and the spectator seated in a darkened auditorium. That is, gestalt may be described in the broader sense as man's (humanity's) ongoing attempt to provide menaing to all things, to bring all things within the grasp of comprehension. Since the natural order of things, according to most scientific evidence, is in fact disorder--the entropic movement toward chaos--our automatic response calls for sufficient action to bring a variety of perceived events into our control, at least to bring them within the range of our understanding, to make them make sense, even if it is to dismiss some of the events as senseless.

The whole process is an attempt to form closure, and the action taken may be overt or covert, conscious or unconscious, if you will. The scenic artist

manipulates the space, magnifies or subdues the texture, distorts the structure, toys and fiddles with some details while omitting others, the designer perhaps builds a sense of foreboding expectation or delightful reflection. He or she does not present us with the world of drama, but with bits and pieces of it. Likewise, the audience member takes the cue and fills the gaps, sees beyond the closed door, follows the ceiling beam into the wings, imagines things that have gone on before, even preconceives at curtain rise the personality of the owner of the particular home or office or tavern. The designer relies heavily on, and hopefully elicits, the active participation of the audience.

A gestalt approach to design seems to provide some ready and stable explanations for a number of issues which arise in the scenic arts. For instance, the gestalt function may account for the audiences' ability to accept a wide variety of theatrical styles or for their excitement (or disdain) when faced with a new and different style. Gestalt theory certainly encompasses a rationale for the audience's discomfort with an unbalanced set (whether intentional or not) and lends some credence to the notion that the blanks in fragmentary scenery will be filled in.

The purpose of this project is not so much to justify gestalt, or provide an elaboration of its possible applications in the analysis of theatrical design. Gestalt here serves as a theoretical base for the introduction of a number of experiments in psychology whose findings appear to present the basis for principles of art which may be used in scene design. In many instances, the research was not performed by gestalt theorists nor were the experiments designed to fit the mold of gestalt psychology. However, all of the research can be understood and applied to theatre with the gestalt approach in the back of the mind. That is to say, the gestalt may be the theoretical framework

for the discussion that follows.

In Psychology of the Arts Kreitler and Kreitler hypothesize that works of art, ". . . produce tensions for which they afford specific reliefs" (1972, 32). Their view is quite compatible with the approach of the gestalt theorists. Scene design, like other art forms, functions to arouse tension in the audience through the manipulation of the design elements and to reduce tension through the unity of the organization, usually occurring at the locus of attention. The degree of the tension and the amount of relief is determined by the designer which, in turn, is dictated by the play.

THE ELEMENTS OF DESIGN

Interestingly enough, the design elements, including line, form, color, size and texture (and there is considerable disagreement among artists as to which and how many there are), are not merely artificial categories by which to provide convenient discussions among practitioners and critics. Some research suggests that we actually see via the elements. Arnheim cites instances among animals in which survival responses are dependent upon rudimentary perception of basic structural and/or color stimuli. (1974, 23). Psychologists have found that young children associate information within general categories on the basis of their perception of striking structural features rather than inividual detail (Arnheim, 1969, 35). In fact, the Physiological nature of perception tends to verify the tenet. As the perceptual information from the retina of the eye flows to the striate cortex at the back of the brain, where most visualization occurs, some of the fibers of the optic tracts detour to the superior colliculus. At this structure in the midbrain apparently a rough map is vizualized of the entire retinal

surface (Kaufman, 1974, 46). In other words, by fractions of a second, our first optical awareness may be of general forms, colors and sizes -- the design elements. This report focuses on findings from research of line, form and color.

Just as scene designers intuitively determine the way in which various design elements communicate specific meanings to the observer and can be manipulated to arouse and reduce tension, psychologists have discovered repeated patterns of response by subjects to predetermined visual stimuli. Among the early research in experimental aesthetics some investigation of the importance of the design elements was conducted. The results formulated a fundamental but interesting principle of design.

<u>In visual unity, design elements function as a hierarchy of influence, in a primary and secondary status</u>.

In a study of aesthetics, Margaret Otis examined the factors affecting the perception of visual unity. She tested subject reactions to various graphic combinations of squares, rectangles, triangles, circles and stars by asking questions related to apperceived unity. Evaluations derived from pleasure were completely avoided. Otis was able to determine from the results a hierarchy of influential design elements. Their rank was prescribed as follows: 1] size; 2) color; 3) direction; 4) form; and, 5) position (1918, 312).

Otis found the elements frequently assumed either a primary or secondary influence as observed by the subjects. When in opposition the primary was stronger, and the secondary was weaker. Indeed, when the primary element determined the unity of the group, the secondary was often disregarded. For example, with the proper use of color and form in the establishment of unity,

color was the primary force while form was a secondary force; and, in most cases, the shape was unnoticed as a unifying influence.

Another investigator, Lynette Feasy, also found one design element more dominant than another. In a preference test of rectangles, subjects indicated a much greater interest in color than in shape (1921, 255). This finding supports Otis' even though the previous study focused on variations in unity rather than on preference choices -- Otis determined color as the second most influential element and form as the fourth.

The specific rank order of the elements may not be of major consequence, particularly since there exists some disagreement over the arrangement of the rankings in other studies as well (Keitler and Kreitler, 1972, 80). Of a more important note is the tenet that within a given visual context, certain elements take priority, often to the psychological "elimination" of others.

In theatre, texture would seem to fall victim to this principle. Usually, texture must be pronounced to a great degree before its influence can extend beyond that of ornamental fill. On the other hand, the influence of the structural skeleton of a setting, its general form, can be easily manipulated depending on the period of the play, the style of the production or the demands of the script. The element of color has far greater opportunities for variation and influence than does size, especially since size is limited by the confines of reality; i.e., the bouderies of their interaction with actors in stage space.

<u>As primary and secondary elements approach influential equality, tension increases.</u>

According to Otis' study, while a secondary element was usually constructive, an increase in its strength tended to be destructive, and a balanced power between elements generally resulted in fluctuation and rivalry (1918, 313-14). In other words, a greater degree of tension was aroused as the secondary element

took on a greater role in the establishment of unity. However, there was apparently a point beyond which the secondary element began to disrupt the visual unity of the picture and tension could not be reduced. To use Otis' pure elements as an example, when color functioned as the primary element and the influence of form, the secondary element in this case, was manipulated to the extent that it was no longer dismissed by the subjects, the two elements entered into conflict with one another and unity suffered while the tension went unabated.

For scene designers this is an impotant finding. It suggests ways in which the degree of tension in an audience may be increased and reduced, and the limits to which audience fatigue may become a risk if tension is not adequately reduced.

LINE

A direct relationship exists between the implied movement of a line and the degree of tension experienced by the viewer.

In an attempt to examine the relationship between lines and feelings Lundholm developed a list of 48 adjectives used to elicit responses from subjects in the form of simple lines drawn to match the meaning or expression of the words. Introspective verbal responses by the subjects to their drawings were then compared with the original adjectives. Specific information was derived from the results about the effects of design elements, especially line and direction. Lundholm summarized his findings in the following comments (1921, 60):

> There seems to be a feeling tone connected with pure lines, as perceived by a majority of observers.
> This feeling tone is probably dependent upon the suggestion of movement

> in the lines; that is, the lines appear to imitate in their movement the motor expression of emotional stress.
> Slow and weak movement is suggested by lines with long and low waves, rapid and intense movement by lines with small waves and acute angles.
> Consequently, emotions with little motor expression are suggested by lines of the former type and emotions with strong motor expression by lines of the latter.
> A finer differentiation of the emotions suggested is most possible. Sad, lazy and quiet lines have practically the same shapes; likewise the furious and exciting are similar.
> When sharp angles predominate in a line of the active type, it seems to acquire an unpleasant feeling tone, as well as an increased intensity in its movements. Thus, a jolly and a furious line differ in the frequency of the acute angles.
> Strength is very often expressed by big and high waves; and even by right angles at times.
> Broadness of a line indicates strength, while thinness indicates weakness and faintness.
> Beauty in a pure line is expressed by unity of direction, continuity, roundness of curves, lack of angles, and periodical repetition of similar elements, or by a certain symmetry; ugliness by the reverse of all these qualities.

Each of Lundholm's points seems to embody fundamental principles of design, but overall it could be stated that according to his findings tension increases as the implied movement of a line increases.

<u>An excessive movement in a line produces in the viewer a lack of tolerance for the degree of tension aroused</u>.

Again, just as with the Otis study of unity, it appears that a point of disruption in the manipulation of line can be reached -- note that an excessive use of acute angles is characterized as "unpleasant," and a lack of unity, discontinuity, sharpness and frequency of angles, a lack of repetition of elements and assymetry combine in various ways to create a feeling of "ugliness." In such a visual presentation tension may be aroused but may not be reduced, lacking a <u>locus</u> of attention -- a place for the eye and mind to rest. This basic principle of harmony is applied intuitively by most designers, but the tangible evidence regarding the effects of lines given in the results of these experiments can provide designers, and certainly teachers, with specific guidelines regarding the reasons underlying the establishment of visual focus in the stage picture.

Lundholm's experiments were replicated by A.T. Poffenberger and B.E. Barrows. They were interested in determining the extent to which movement-oriented design elements affected reactions to line drawings. The results of both studies were strikingly similar. Sadness, for example, seemed best expressed by a slow, downward curve of extreme measurements. A moderate series of upward curves best depicted merriment. While seriousness was drawn as a horizontal or a slightly angular line, an upward curve represented playfulness. A horizontal line or a slowly curving line was quiet, and an acute angle or a rapid series of angles upward were agitating. Horizontal or slowly curving lines were also interpreted as gentle, and lines slowly curving downward were perceived as weak and lazy. The apperception of a dead movement was slow and downward. Harshness, power and fury were indicated by angular, upward lines (1924, 202).

According to the results of Poffenberger and Barrows they were able to determine two extremes. A slow downward line was nearly void of tension, while a rapid series of upward angles provided little opportunity for the release of tension. The rhythm and frequency of upward angles seem to be important factors in the maintenance of tension. While the rapid series of angles were found agitating, a less frequent use of upward angles were considered intense but not necessarily detrimental. Possibly with fewer angular movements, the visual design allowed a degree of reduction in tension to occur.

Similar findings have been established by other researchers in psychology (Werner and Kaplan, 1963; Scherer and Lyons, 1957). Kate Hevner examined not only geometric displays but representations of three paintings distilled to abstract designs of bsic curved and straight lines. The results of subjects' responses, based on selections from 66 adjectives, were consistent with the previous research (1935, 396-97). Charles Osgood cites an experiment with

artists and non-artists involving their responses with the Semantic Differential, bipolar adjectives, to representative paintings, each embodying a dominance of different line forms. Typically, both groups judged jagged lines as active, curved lines as passive, massive patterns of lines as chaotic and straight lines as orderly, though the srtists exhibited a greater degree of accuracy and predictability in their selection (1957, 293).

Generally, psychologists have found what designers seem to know intuitively about the effects of lines. But the predictability with which certain lines produce specific emotional responses is surprising. It might also be revealing to examine the effects produced by various combinations of lines, an activity engaged in with regularity by designers. Of special note is the matter of tension reduction, or lack of it. It seems that a careless use of intense movement in lines can reach a point of diminishing returns for the onlooker. Without an opportunity to reduce the tension aroused by frequent and acute angular movements, a negative effect appears to take hold. Certainly, there are instances in dramatic presentations where such an experience for the audience would be a desirable aim, but the designer should be in control of the degree and duration of the tension.

FORM

Much of the findings from gestalt psychology with regard to the effects of graphic forms and their pictorial arrangements have been well documented and, in fact, incorporated into the vocabulary of the art world as perfectly acceptable "rules of thumb." Of particular interest is the reasearch of Max Wertheimer. His investigations in the early part of the century resulted in a number of basic principles of organization of forms. The principles follow in somewhat quick review.

The principle of similarity -- "the degree to which parts of a pattern resemble each other in some perceptual quality will help determine the degree to which they are seen as belonging together" (Arnheim, 1969, 67).

The principle may apply to size, shape, brightness or color, location, spatial orientation, direction, even speed. Typically, in an array of black dots among several white ones, the perceiver will mentally associate or connect the black dots, thus creating a unified form. On the stage the repetition of a particular motiff used to establish visual as well as thematic unity, for example, is a function of this fundamental principle. An obvious of simple presentation of similarity results in minimal tension, while a subtle or complex arrangement of similarity arouses maximum tensions. Similarity of forms arouse a slight degree of tension and achieve release readily; but, interestingly, only a perceptible variation in the similarity among the forms will increase the tension considerably. A row of similar arches is not as eye-catching as a row of arches with a slight variation in the two center stage. The variation is not enough to dismiss as merely seeing different forms yet not similar enough to accept as the same form. Tension is aroused.

The principle of proximity -- elements that are close together tend to be perceived as a group.

The closer forms are to one antoher the less reliant their unity is on similarity; the farther apart, the more important similarity becomes. A cluster of multishaped banners may have a tension arousing and reducing effect, just as would a series of rectangular flags poritioned at various points over the stage.

The principle of common fate -- elements moving toward the same point,(attractive forces) are perceived as a coherent group.

The direction or implied movement of forms, whether unidirectional, convergent

or divergent, tend to arouse tension. The degree of tension depends upon the complexity of the path or the boldness of the shapes. Diagonals, angular lines, have already been established as dynamic features of a design. The exaggerated inclined rafters of an interior setting, for example, can arouse tension in the audience, but the tension will also be released in the unity achieved by the common fate of their direction.

The principle of continuation or consistent shape -- "when there is a choice between several possible continuations there will be a spontaneous preference for the one that carries on the intrinsic structure most consistently" (Arnheim, 1969, 71).

In order to minimize tension, an observer will minimize visual discontinuity. Two angles, for instance, joined together at their apexes and resting on their sides, would commonly be perceived not as two angles but as two crossed lines. It is less tension producing for the eye to continue its path, creating two new lines than to change directions in order to maintain the old forms. When a figure is incomplete, however, considerable tension is aroused in the viewer, because continuation is not easily attained. But the "pressure of the gestalt" forces the onlooker to find the gaps and fill them, usually with the most satisfying figures as a result. If closure is not completed, however, both a lack of organization and the tension remain.

This principle is particularly important to styles of stage scenery. Most non-realistic scenery relies on the ability of the audience to fill in the omission of detail and to connect mentally discontinued parts. It may be for that reason that stylized scenery is a much more exciting form of theatrical presentation for the experienced theatre-goer than standard realism.

COLOR

Color and its properties have been the focus of empirical examination for a number of years, especially by some well established manufacturers of color pigment. But psychologists have taken interest in the expressive qualities that color exhibits as perceived by the viewer.

The degree of tension aroused in the viewer is directly related to the specific color and color combinations.

Lois B. Wexner employed groupings of 164 adjectives in a study of male and female evaluations of basic colors. Although there was no significant difference between the choices of the two groups, definite patterns in the overall color selections emerged. Red was viewed as stimulating and exciting; the combinations of red, brown, blue and black were defiant, contrary and hostile, while red and black were rated as powerful, strong and masterful. Orange and black were often described with the adjectives of distressed, disturbed, upset, and purple and black were described as dignified and stately. Brown and black were seen as despondent, dejected, unhappy and melancholy. Several other combinations of colors provided consistent connotative meanings to the subjects. Yellow, red and orange, for example, were evaluated as cheerful, jovial and joyful. Also, the colors blue and green were tender, soothing, calm, peaceful and serene, and the combinations of blue, brown and green were apparently perceived as secure and comfortable (1954, 432-35). The specificity of the results of Wexner's study is nearly astonishing. That subjects respond consistently to certain colors is not surpising, but that rather intricate combinations of colors elicit predictably consistent reactions seems beyond what we might normally intuit on our own.

According to the results of Wexner's investigations, not only did certain colors convey consistent emotional tones, but color combinations appeared capable of arousing significant tensions. Orange and black were actually distressing to the subjects, and yellow, red and orange thegether were exciting but not disruptive, while blue and green combinations seemed to arouse a minimal degree of tension.

It is the tension aroused by color combinations that is of particular concern to the designer. Kreitler and Kreitler address the issue of tension-laden colors specifically (1972, Ch.2). In a series of experiments using 332 combinations of colored cards varying in hue, saturation and brightness, they came to the following major conclusions.

1) Combinations of complementary colors are extremely tension laden.

Of the combinations forwarded by subjects as tension-laden, 83 percent consisted of complements or near complements. Frequently, in scene design a strict use of complements is avoided, unless separated by a more nuetral color or an intermediate. The neutral area provides an opportunity for the tension aroused by the complements to subside. When separated, the opposites act to relieve one another. In this instance, the greater the tension, the more intensely the experience of relief (1972, 41).

2) Color combinations similar to each other tend to arouse tension in the perceiver.

Here tension is increased when two colors are similar but not similar enough to be regarded as the same nor disparate enough to be dismissed as two different colors. The tension increases in an effort to mollify the difference, to "simplify" the pitorial field by bringing the two colors together as one. The risk of the monochromatic stage setting, it seems, lies in the degree of similarity expressed in the tints and shades of the color. If they are too similar, little tension is aroused and boredom results, but when the degrees

vary enough in saturation as well as value, a monochromatic arrangement can be quite exciting for an audience.

3) Highly saturated colors tend to arouse tension while less saturated colors tend to reduce tension.

A common practice in scene design has been to paint large areas with lighter colors, saving the stronger colors for small areas of ornamentation and decor. The principle identified by Kreitler and Kreitler provides a reason for the practice and widens the options to encompass more than just variations in value. Adjustments in the saturation of colors may accomplish the same pleasing effects but also allow for some subtle arousals of interest in the audience. Further, an awareness of the effects that varying saturations have on tension levels could lead to some provocative arrangements of rhythm with colors or some impressive methods of controlling and guiding focus with color, for either an abrupt or a gradual release of tension.

4) Tension will be greater when two colored areas are separated by sharp rather than poorly defined contours.

"An increase in contrast produces greater dramatic effect." That particular phrase has been spoken in more than one design classroom, but its meaning can be explained by this principle stated above which is essentially gestalt in character. As the graduation from one color to another increases, the contrast and, in turn, the tension decreases. The reverse effect, of course, is also reliable.

5) Colors similar but distinctly different tend to reduce tension.

Analogous colors have generally thought to produce an effective but pleasing arrangement on the stage. That the colors are different yet similar accounts for their attraction, according to this principle. The level of tension produced by the combination of colors is dependent upon the movement of the colors either

away from or toward each other. In either case, the tension produced will increase.

This report has only touched on a portion of the surface of the research in experimental aesthetics/psychology. A very large body of knowledge still awaits development. Some of the research deals with design analysis, as exemplified by the studies included in this report; other research looks at general subject groups (artists/non-artists, for example) and yet a third area concentrates on personality assessment (much of it not useful to our purposes). But from the research field of aesthetics seem to emerge two exciting trends: 1) the empirical investigations tend to verify existing principles of design that were originally developed intuitively but offer possible explanations previously not considered; and, 2) for every answer the investigations are able to provide, several, more specific questions arise.

CONCLUSION

The fundamental notion of gestalt theory identifies clearly a major task for the role of the scene designer. If he or she reaches toward the objective of arousing and periodically relieving tension in the audience through the organization of the design elements of the stage picture, the designer is essentially inviting the audience to participate in the production -- to become an accomplice with the artist. In order to comprehend the setting, to reproduce the gestalts intended by the designer, the audience must, by the nature of the process, involve itself actively in the play. The more "complex" the gestalts, the greater the tension, the more satisfying the release of tension, the more involved the audience member has become. The precision with which the design is executed, aesthetically

as well as technically, is really the precision with which the designer communicates with the audience. The more effective the communication is the greater the theatrical experience for its audience. And effective communication, as we are aware, is entirely reliant upon the designer's knowledge and understanding of the principles its language.

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